

Science Spotlight

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Pesticide Use among Tanzanian Farmers in Africa

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Pesticides are used around the world to control pests that affect crops. Estimates indicate that worldwide, hundreds of thousands of people die each year from pesticide exposure. The risk of exposure is exacerbated in low- and middle-income countries because farmers there often have less knowledge about adverse health effects of pesticide exposure and inadequate access to safe and effective personal protective gear.



Researchers found pesticides stored in many homes throughout their field study.

(Photo courtesy of E. Lekei)

In a recent issue of *BMC Public Health*, Elikana Lekei, Ph.D., and his colleagues Aiwerasia V. Ngowi, Ph.D., and Leslie London, Ph.D., investigated pesticide use in the Arusha region of Tanzania, Africa by surveying 121 farmers on their use, storage, and exposure to pesticides. More than 90 percent of the farmers surveyed had experienced a pesticide-poisoning event. “In our experience, pesticide poisoning becomes a ‘risk of the job’ that people become used to,” London says. “In developed countries, there are

measures in place to control exposures, but these don't really exist in developing countries, and there is real pressure on farmers to use pesticides.”

Lekei said that one reason pesticide-poisoning events are so common among the farmers is because at least 79 percent store the chemicals in their homes to protect the costly products from being stolen. “Many farmers, particularly those with lower levels of education, are not aware of the health-related risks and the environmental hazards these chemicals pose for them and their families,” London says.

Pesticide application is another pathway for pesticide exposure. Although protective gear should not be the sole method to prevent pesticide exposure, it can help limit adverse events. The researchers found a significant association between poisoning events and nonuse of protective gear. About 40 percent of the surveyed farmers reported wearing protective gear like gum boots, long coats, hats, gloves, respirators, and facemasks. However, most of the protective items (60 percent) were damaged or contaminated, which may explain why the equipment is used so infrequently. Even when protective gear was used, it was often inappropriate or insufficient for the farmers’ uses.

Lack of information about the proper procedures for handling pesticides is a primary cause of their misuse, which is exacerbated when distributors repackage their products and sell them in smaller amounts without labels or safety information. In this study, the researchers found that 25 percent of products had been repackaged into secondary containers including paper and plastic bags and glass or plastic bottles.

Lekei and his colleagues also identified disposal of excess pesticides and empty containers as routes of exposure. Farmers reported disposing of unused pesticides by spraying them on crops or dumping them on farm ground. They got rid of empty containers by burying, burning, dumping, or selling them back to retailers. Some farmers reused the containers for household purposes, which poses serious exposure risks for all household members of the household.

The authors agreed that education is key to getting more farmers to store their pesticides outside the home. Information on pesticides, although available to farmers, is not effectively communicated. Pamphlets are often not legible or in a foreign language, for example. “Other studies we have been involved with have shown that typical hazard-communication tools, such as labels and pictograms, are not very good communication tools,” London said. “In fact, any communication tool requires training to support learning and understanding. I would also add that peer training by other farmers and experiential training, such as farmer field schools, are the best training methods. Simply giving farmers written information in the form of pamphlets or giving lectures are very poor methods.”

Farmers also can be taught self-surveillance skills that they can use when handling and spraying pesticides. “They can be taught how to recognize the signs and symptoms of pesticide poisoning, the

adverse effects on their environment, and what the law says about use and disposal of pesticide wastes as well,” explained Ngowi.

The research team concluded that comprehensive interventions rather than solely knowledge-based strategies are needed to reduce exposure and health risks. Any strategy should include training, improving labeling, reducing barriers so that safe behaviors can be adopted, promoting control measures other than personal protective equipment, and supporting integrated pest management.

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Citation:

[Lekei EE, Ngowi AV, London L.](#) 2014. Farmers' knowledge, practices and injuries associated with pesticide exposure in rural farming villages in Tanzania. BMC Public Health 14:389.